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10/612,080	07/01/2003	Dong-Hwan Kim	764-23	5821

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EXAMINER	
TSAI, CAROL S W	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,080	KIM ET AL.	
	Examiner	Art Unit	
	Carol S Tsai	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/01/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 6,208,147 to Yoon et al. (referred thereafter as Yoon et al.'147)

With respect to clams 1 and 4, Yoon et al.'147 disclose a method for evaluating a capacity of at least one secondary battery, the method comprising: (a) preparing the at least one secondary battery to at least one of partially charged to a voltage less than a full charge voltage and partially discharged to a voltage less than the full charge voltage (see col. 6, lines 49-52); and (b) measuring an impedance spectrum for the prepared battery (see col. 6, lines 53-56); (c) mathematically operating specific internal resistance components obtained from an equivalent circuit model fitted from the impedance spectrum measured (see Figs. 4 and 9; col. 6, lines 61-65; and col. 7, lines 35-45); and (d) comparing the mathematical operation value of the resistance components with an initial discharge capacity graph to evaluate an initial discharge capacity of a unknown battery of the same group (see Fig. 7; Abstract, lines 1-13; col. 2, lines 35-58; and col. 6, line 61 to col. 7, line 56).

As to claim 2, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum including model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

As to claim 7, Yoon et al.'147 also disclose the batteries being discharged to a voltage level less than a full charge voltage to provide less than 10% of the discharge capacity (see col. 6, lines 57-60).

As to claim 8, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum including model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

As to claim 9, Yoon et al.'147 also disclose the impedance spectrum being measured in a frequency range of 10 mHz to 10 kHz (see col. 6, lines 53-56).

As to claim 10, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum including model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of U. S. Publication 2003/0082458 to Oyama.

As noted above, with respect to claims 3 and 5, Yoon et al.'147 disclose the claimed

invention, except for the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C.

Oyama teaches the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C (see paragraph 0127).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147's method to include the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C, as taught by Oyama, in order that the charging capacity can be set at 80% of that estimated from the amount of the redox active materials.

As to claim 6, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum includes model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

5. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of U. S. Patent No. 6,160,382 to Yoon et al. (referred thereafter as Yoon et al.'382).

As noted above, Yoon et al.'147 disclose the claimed invention, except for resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector.

Yoon et al.'382 teach resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector (see Fig. 1 and col. 4, lines 17-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147's method to include resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector, as taught by Yoon et al.'382, in order to determine characteristic parameters of a charge storage device.

6. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of Yoon et al.'382 as applied to claims 1 and 9-11 above, and further in view of U. S. Publication 2003/0082458 to Oyama.

As noted above, Yoon et al.'147 in combination with Yoon et al.'382 teach all the features of the claimed invention, but do not disclose the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C.

Oyama teaches the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C (see paragraph 0127).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147 in combination with Yoon et al.'382's method to include the discharge capacity graph being a capacity correlation graph obtained from a

relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C, as taught by Oyama, in order that the charging capacity can be set at 80% of that estimated from the amount of the redox active materials.

As to claim 13, Yoon et al.'147 also disclose the secondary battery including a lithium ion battery, a lithium polymer battery, a Ni--Cd battery and a NiMH battery (see col. 5, lines 10-12).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sasaki et al. disclose a secondary battery which is less expensive, whose safety is extremely high, which is of large capacity as well as good cyclic characteristic, and which uses an aqueous solution for the electrolytic solution.

Yamada et al. disclose a non-aqueous electrolyte for batteries comprising the dissolving of an electrolytic salt in an organic solvent, wherein said organic solvent contains at least one type each of cyclic carbonate compound, alkyl mono-carbonate compound represented by chemical formula (1), alkylene bis-carbonate compound represented by chemical formula (2), glycol diether compound represented by chemical formula (3) and phosphorous-containing organic compound.

Oyama disclose a polymer electrolyte for lithium secondary batteries in which growth of lithium dendrites is suppressed being disclosed, batteries exhibiting excellent discharge characteristics in low to high temperature, comprising a polymer gel holding a nonaqueous

solvent containing an electrolyte, wherein the polymer gel comprises (I) a unit derived from at least one monomer having one copolymerizable vinyl group and (II) a unit derived from at least one compound selected from the group consisting of (II-a) a compound having two acryloyl groups and a (poly)oxyethylene group, (II-b) a compound having one acryloyl group and a (poly)oxyethylene group, and (II-c) a glycidyl ether compound, particularly the polymer gel comprises monomer (I), compound (II-a), and a copolymerizable plasticizing compound being disclosed.

Yoon et al. disclose a method of measuring battery capacity using a voltage response signal based on a pulse current, where the method includes the steps of: measuring a voltage response signal based on a pulse current signal applied to a primary or secondary battery; performing an approximation of the measured voltage response signal to an equivalent circuit model composed of resistors, capacitors and transmission lines to determine the model parameters; and determining the unknown battery capacity from the voltage response characteristics based on a correlation between the measured capacity and the model parameters, which correlation is previously determined by a real-time discharge method, thereby takes a shorter time than a real-time discharge method and delivering efficiency and reliability in determining model parameters of an equivalent circuit which are in close correlation with the charge/discharge condition of the battery.

Nakano et al. disclose a lithium secondary battery comprising a positive electrode, a negative electrode and an organic electrolyte, and the electrolyte comprising a solvent mixture of at least one kind of fluorine substituted propylene carbonates used as a first solvent and at least

one kind of low viscous solvents for lowering the viscosity of fluorine substituted propylene carbonates, used as a second solvent.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. W. Tsai whose telephone number is (571) 272-2224. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax number for TC 2800 is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (571) 272-1585 or (571) 272-2800.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 872-9306. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. W. Tsai
Patent Examiner
Art Unit 2857

10/25/04